CLAIMS

What is claimed is:

1. A welding implement, comprising:

a torch head operable to conduct electricity to a welding electrode disposed therein; and

a thermal storage member adapted to absorb heat from the torch head, wherein the thermal storage member is electrically isolated from the torch head.

2. The welding implement as recited in claim 1, wherein the thermal storage member comprises metal.

3. The welding implement as recited in claim 1, wherein the thermal storage member comprises aluminum.

4. The welding implement as recited in claim 1, comprising an electrically conductive tube operable to conduct electricity and gas to the torch head and heat from the torch head to the thermal storage member, wherein the thermal storage member is disposed around at least a portion of the tube.

5. The welding implement as recited in claim 4, comprising an electrical insulator disposed between the tube and the thermal storage member, wherein heat is conducted from the tube to the thermal storage member through the electrical insulator.

6. The welding implement as recited in claim 5, wherein the electrical insulator is adapted to position the thermal storage member axially along the tube.

7. The welding implement as recited in claim 4, wherein the tube comprises a first conductive metal and the thermal storage member comprises a second conductive metal.

8. The welding implement as recited in claim 1, wherein the torch head is air-cooled and operable to conduct 300 Amps at a 60 % duty cycle with a temperature increase of less than 30 K.

9. The welding implement as recited in claim 1, comprising a second tube disposed around a portion of the tube located proximate to the torch head.

10. The welding implement as recited in claim 1, comprising an electrical insulator disposed over the tube and the thermal storage member.

11. A welding implement, comprising:

a tube operable to conduct electricity to a torch head and to conduct heat from the torch head;

a metal member disposed around the tube; and

an electrical insulator disposed between the tube and the metal member.

12. The welding implement as recited in claim 11, wherein the tube comprises copper.

13. The welding implement as recited in claim 11, wherein the metal member comprises aluminum.

14. The welding implement as recited in claim 11, wherein the metal member is disposed around at least a portion of the tube.

15. The welding implement as recited in claim 11, wherein the electrical insulator is adapted to limit axial movement of the metal member relative to the metal tube.

16. The welding implement as recited in claim 11, comprising a first connector coupled to the tube and coupleable to a second connector coupled to a gas hose and a power cable.

17. The welding implement as recited in claim 11, comprising the torch head.

18. The welding implement as recited in claim 11, comprising an insulating material disposed over the tube and metal member.

19. The welding implement as recited in claim 11, wherein the insulating material is adapted with a plurality of ridges adapted to produce friction with a handle disposed over the plurality of ridges.

20. A process of cooling a welding implement, comprising:

storing heat from a torch head in a thermal storage member electrically isolated from the torch head; and

transferring the heat stored in the thermal storage member to the air when power to the welding implement is removed.

21. The process as recited in claim 20, wherein storing heat from a torch head comprises transferring heat from the torch head to a tube adapted to conduct electricity and gas to the torch head.

22. The process as recited in claim 21, wherein storing heat from a torch head comprises transferring heat from the tube to the thermal storage member through an electrical insulator.

23. The process as recited in claim 20, wherein transferring the heat from the thermal storage member comprises transferring heat from the thermal storage member to the tube.

24. The process as recited in claim 23, wherein transferring the heat from the thermal storage member comprises transferring heat from the tube to a power cable coupled to the welding implement.

25. The process as recited in claim 23, wherein transferring the heat from the thermal storage member comprises transferring heat from the tube to the torch head.

26. A welding implement, comprising:

means for storing heat from a torch head to a thermal storage member electrically isolated from the torch head; and

means for transferring the heat stored in the thermal storage member to the air when power to the welding implement is removed.

27. A welding implement, comprising:

a torch head;

a first tubular member having a passage therethough to couple gas to the torch head; and

a second tubular member disposed over the first tubular member proximate to the torch head.

28. The welding implement as recited in claim 27, wherein the first and second tubular members comprise copper.

29. A TIG welding system, comprising:

a power source; and

an air-cooled TIG welding torch electrically coupleable to the power source, comprising:

a torch head adapted to conduct electricity to an electrode disposed therein;

a thermal storage member electrically isolated from the torch head and adapted to store heat from the torch head when power is applied to the torch head; and

a first electrical insulator disposed over the torch head and thermal storage member.

30. The TIG welding system as recited in claim 29, comprising:

a conductive tube adapted to couple electricity and gas to the torch head; and

a second electrical insulator disposed between the conductive tube and the thermal storage member.

31. The TIG welding system as recited in claim 29, wherein the air-cooled TIG welding torch is operable to conduct 300 Amps at a 60 % duty cycle with a temperature increase of less than 30 K.

32. The TIG welding system as recited in claim 29, wherein the air-cooled TIG welding torch is operable to conduct 300 Amps at a 60 % duty cycle with a temperature increase of less than or equal to 27 °F.